

Responsive Management



A Needs Assessment for Environmental Education in Florida

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Mark Damian Duda, Executive Director
Peter E. De Michele, Ph.D., Director of Research
Carol Zurawski, Research Associate
Martin Jones, Research Associate
Joy Yoder, Research Associate
William Testerman, Director of Survey Center
Alison Lanier, Business Manager
Steven J. Bissell, Ph.D., Qualitative Research Director
Ping Wang, Ph.D., Quantitative Research Associate
James B. Herrick, Ph.D., Research Associate

130 Franklin Street
Harrisonburg, VA 22801
Phone: 540/432-1888 Fax: 540/432-1892
E-mail: mark@responsivemanagement.com
www.responsivemanagement.com

Executive Summary

The goal of this needs assessment is to assist the Advisory Council on Environmental Education (ACEE) in guiding state-supported environmental education opportunities and in soliciting and recommending projects that will represent the best use of funds available. This needs assessment should also assist in developing effectively designed environmental education programs and projects. The objective of this needs assessment is to present an environmental education strategy and direction for the State of Florida for adult residents and visitors. This needs assessment also provides the ACEE and Florida environmental educators scientific baseline information on adult Floridians' and tourists' opinions, attitudes, knowledge levels and behaviors toward environmental issues and environmental education in Florida.

This information will provide a solid foundation of knowledge upon which to build effective environmental education programs and measure the effectiveness of future efforts. Without quantified information on the highest priority environmental issues and public knowledge of and opinion on environmental issues, environmental education programs might not be focused on the highest priority environmental issues facing Florida, nor targeted to the appropriate audiences. Programs would be based on speculation rather than fact.

This project comprises one of the most exhaustive reviews, data collections, and analyses to date of Floridians' and tourists' environmental education needs. While there are numerous important and salient individual points, five factors are evident. First, Florida environmental educators, scientists, administrators, Floridians, and tourists share the common value that environmental education is an important and worthwhile activity. Second, the most important issues for the direction of environmental education efforts in Florida are water resources, land use/growth management, habitats and ecosystems, coastal protection, and personal actions. Third, Floridians are concerned with environmental issues, support environmental protection and environmental education programs, but have a low level of information about the environment, even at the most basic level. Fourth, water resource issues are currently the most important and salient environmental concern to Floridians. Finally, environmental action programs can and should be a part of most environmental education programs in Florida. Floridians can and will act on behalf

of the environment as the high degree of recycling currently attests. The ACEE and the Florida environmental education community should focus on five broad topic areas:

- Water resources
- Land use and growth management
- Habitats and ecosystems
- Coastal protection
- Endangered species

All programs within each broad topic area should target specific groups with specific messages.

Water Resources

Water resource issues are a dominant topic area among Florida environmental educators, scientists, and natural resource administrators. It is also the most salient and important topic area for Floridians. Water resources should also be a dominant topic area among ACEE and Florida environmental education projects. Specific water resource topic areas should include the following: a major emphasis should be on 1) water conservation, 2) water quality, and 3) water pollution, in general. Other topic areas should be industrial discharges, sewage, septic tanks, storm water, underground storage tanks, injection wells, saltwater intrusion, and toxic/hazardous wastes.

Programs must include, and possibly emphasize, the importance of water to human health. Past research indicates that public support is highest on environmental issues when the issue is directly related to human health. Water resource conservation education action programs should build upon the great success of the past decade's recycling programs. We recommend projects that develop "water recycling" programs and action items. Florida could lead the nation in water conservation education by developing and implementing a "water recycling" program of the magnitude of the newspaper and other household product recycling programs. The jump off point for such a program is the fact that most Floridians now recycle household waste.

Finally, we recommend that the Florida environmental education community consider developing a major campaign in Florida focused on water quality, quantity, and conservation, and consider using this as the centerpiece or umbrella campaign that would tie together all

environmental education efforts in the state. Part of this would be the development of a water conservation logo, perhaps playing upon the current recycling logo.

Land Use and Growth Management

Environmental education programs on land use and growth management was as important a topic as water resources to Florida educators, scientists, and natural resource administrators. Specific topic areas for environmental education efforts should emphasize the need for planning and habitat protection, sustainable development, the role of citizens in planning/legislation, and urban sprawl.

One of the more interesting and surprising findings of this study was the general lack of awareness of, and any degree of major concern over Florida's growth and development. In the focus group and personal interviews, population growth and overpopulation issues only showed mixed concern. There was not a clear distinction between total population levels in Florida as opposed to the distribution of population. In the survey, only slightly more than 1 in 10 (11%) Floridians stated that development, habitat loss, or population growth was the most important environmental issue facing Florida. Even when asked what the second most important environmental issue facing Florida was, only 9% mentioned a topic related to development, habitat loss, or population growth (while the highest answer was "don't know" at 30%). Our findings indicate that Floridians just aren't putting together the fact that Florida's population growth and subsequent development are an important cause of environmental problems in Florida. This is in stark contrast to the fact that growth issues and management was a top concern for Florida environmental educators, scientists, and natural resource administrators. These educators, scientists, and administrators should realize that population growth and overpopulation issues do not receive the same level of saliency among Floridians or tourists as they do among environmental professionals. Concern about these issues, even to some extent any great awareness, should not be taken for granted as one develops environmental education projects and programs.

Habitats and Ecosystems

Environmental education programs related to habitat and ecosystem issues were a high priority for a slight majority of Florida environmental educators, scientists, and natural resource administrators. Programs should emphasize habitat loss and fragmentation, by far the most important subject area here according to the Florida environmental community. Other topic areas should include information in general, wetlands, and land acquisition and management.

Coastal Protection

Coastal protection was an important but second-tier priority for Florida environmental educators, scientists, and natural resource administrators. Although not top-of-the-mind as an important environmental concern for Floridians, it is considered an important priority issue for environmental education efforts. Among Florida environmental educators, scientists, and natural resource administrators, there was no clear cut subject matter as a priority for coastal resources, though beach preservation and development were important for some. It is interesting to note that beach erosion was the highest priority environmental problem among Floridians although it was only a minor issue as a coastal protection environmental education subject among educators, scientists, and administrators. It is important to include human health factors as they relate to coastal protection, such as the cleanliness of fish and shellfish, in any program focusing on this topic. As previously noted, the public is more concerned about health issues than they are about other issues such as the recreational value of the coast or the habitat issues. These are certainly important, but not nearly as important as the human health issue.

Endangered Species

Environmental education programs focused on endangered species were not a top priority for Florida environmental educators, scientists, and natural resource administrators. However, endangered species issues were an important topic for many Floridians. Because of the familiarity and support, in general, for endangered species programs, some environmental education efforts should continue to inform and educate Floridians about endangered species. Although Floridians care about and support endangered species programs, the level of factual information was remarkably low. Florida environmental education programs should continue to stress the connection between endangered species and habitat loss. Though empathy for

endangered species is important, the overall lack of any kind of factual knowledge among Floridians regarding endangered species should also be noticed by educators.

Environmental Action

Although we do not recommend against environmental education programs that focus on environmental action as a stand alone topic, a more important role of environmental action would include well-designed, action-education programs within each of the five recommended topic areas aimed at the recommended target audiences. Recycling was an important breakthrough in developing the propensity to act on behalf of the environment. Action components of environmental education programs should build on the fact that most Floridians recycle. The high degree of recycling in Florida should be recognized in programs and used as the basis for other positive environmental action programs, the highest priority of which should be actions related to water conservation, although action can be used in other programs as appropriate. There are several other considerations when developing projects and programs to create positive environmental behaviors:

1. Develop programs that appeal to people's emotions. The emotional element is necessary to motivate people on environmental issues. Additionally, although Floridians care about environmental issues, their environmental knowledge levels are quite low. Strive to teach factual knowledge for sure, but programs based upon emotional appeals work well, too.
2. Inform target groups of specific things they can do to help the situation. A lack of specificity in the past has led to confusion about what to do. Also, target groups should be given one message at a time. Too many action items make for a confusing campaign.
3. An environmental action program must be made convenient for people to want to participate. Many action programs are inconvenient and not worth the trouble to some groups.
4. People must be constantly reminded about the progress they're making. Without seeing the direct results of their efforts, they lose sight of the goal and lose interest in the program. This implies that messages must be redundant.

5. Programs must be sincere. Distrust of government is high. Research indicates that one reason for not participating in some environmental programs is the perception of personal agendas and a lack of following through on a government's well-intended program.
6. Action programs are usually best when they are local.

Florida environmental educators should be aware of these issues and evaluate whether they apply to their own situation and target audience. The ACEE and Florida educators should be aware that although there is strong support for environmental protection and environmental education, there is some skepticism among Floridians on the ability of the government to get the job done, and get the job done by itself. The sugar ballot initiative appears to be an example. First, the sugar tax initiative was not defeated on anti-environmental grounds, but on grounds of government inefficiency. Environmental educators can counter these future arguments by enhancing public communications efforts on the environmental successes of government agencies. Another upshot to this is the importance of partnerships with government, non-government, and private business interests to enhance confidence in environmental efforts. The ACEE and the Florida environmental education community should consider refocusing some resources to distributing, promoting, and repeating existing programs and products rather than continually developing new environmental education materials, programs, and products. We believe it is very important to consider the importance of spending the necessary resources distributing, promoting, and reusing the many excellent education programs that have already been developed. Program and product development is expensive and many times once a product or program is developed and presented once or twice it is retired, only for the cycle to begin again.

We recommend that the Florida environmental education community spend the necessary resources promoting and distributing previously successful environmental education programs and products. Only a small number of Floridians have seen or heard any of the many excellent products and programs already developed. Spend resources in developing a few excellent programs, projects, and materials and then spend the necessary time and money distributing and promoting the education programs and materials, as opposed to developing numerous programs and products and not spending the necessary time promoting and distributing them. The ACEE and the Florida environmental education community should strongly encourage the

dissemination of environmental education information and training materials to Florida environmental educators, scientists, biologists, and administrators through in-service workshops, continuing education courses, seminars, and workshops. The most important sources of information about environmental education for Florida educators, administrators, and scientists were in-service workshops, continuing education courses, seminars, and conferences.

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Chapter 1: Introduction and Overview of Environmental Education

Introduction

The protection of Florida's natural environment ultimately depends upon the commitment of its residents and visitors to act on its behalf. The key to instilling this commitment is through effectively designed environmental education and information programs. The goal of this needs assessment is to assist the Advisory Council on Environmental Education (ACEE) in guiding state-supported environmental education opportunities and in soliciting and recommending projects that will represent the best use of funds available. This needs assessment should also assist in developing effectively designed environmental education programs and projects. The objective of this needs assessment is to present an environmental education strategy and direction for the State of Florida for adult residents and visitors. This needs assessment also provides the ACEE and Florida environmental educators scientific baseline information on adult Floridians' and tourists' opinions, attitudes, knowledge levels and behaviors toward environmental issues and environmental education in Florida.

This information will provide a solid foundation of knowledge upon which to build effective environmental education programs and measure the effectiveness of future efforts. Without quantified information on the highest priority environmental issues and public knowledge of and opinion on environmental issues, environmental education programs might not be focused on the highest priority environmental issues facing Florida, nor targeted to the appropriate audiences. Programs would be based on speculation rather than fact. However, with the information generated from this study, environmental education programs, projects, messages, and target audiences can be prioritized, targeted, and developed in meaningful ways. Environmental scientists direct their management efforts on biological and environmental information collected based on the scientific method. Environmental education programs should be based on the same scientific method. Armed with this information, Florida's environmental educators will be able to develop more effective environmental education programs, target their audiences more effectively by matching specific messages to specific audiences, and evaluate and measure -- quantitatively -- the effectiveness of their efforts. Also, by developing a process to quantify the progress of environmental education efforts, the Florida environmental education community

will be able to demonstrate their successes in a quantified manner and justify money that is spent on environmental education in Florida.

The approach used to develop this needs assessment was straightforward. Environmental issues and environmental education programs were assessed from the "inside-out" as well as from the "outside-in." First, the full-range of environmental issues challenging environmental educators in Florida were identified through 1) a literature review of journals, magazines, newsletters, other publications, and World Wide Web sites to identify and define Florida's key environmental issues (Phase I), and 2) a telephone survey of Florida educators, environmental scientists, biologists, and administrators to rank Florida's key environmental issues in terms of overall importance, vulnerability, and need of immediate and long-term attention and action on behalf of Floridians and tourists (Phase II). These methods provided a view of Florida's environmental issues and educational priorities from the "inside-out." Thus, the priority program areas recommended in this report are based upon the highest priority environmental issues facing Florida as defined by Florida scientists, environmental educators, and agency administrators. Next, environmental education needs were identified from the "outside-in" by identifying and measuring Floridians' and tourists' attitudes toward environmental issues using both qualitative and quantitative research methodologies. Qualitative research included a focus group with Florida residents and personal qualitative interviews with Florida tourists (Phase III). A scientifically reliable telephone survey and in-depth quantified interviews were conducted with Florida residents and tourists (Phase IV). This qualitative and quantitative research identified what Florida environmental educators are "up" against, in terms of Floridians' and tourists' attitudes toward and knowledge of environmental issues in Florida. This report is based on these two perspectives: environmental education from the "inside-out" and environmental education efforts from the "outside-in."

This report presents the ACEE with recommendations, major findings of Phases I - IV, and a complete methodology for all phases of this study. Phase I - IV reports can be obtained through the Advisory Council on Environmental Education, Florida Game and Fresh Water Fish Commission, 620 South Meridian Street, Tallahassee, Florida, 32399-1600, Phone: (850) 487-0123.

Phase I: A Needs Assessment for Environmental Education in Florida: A Review of the Literature and Content Analysis. April 1997. 30pp.

Phase II: A Needs Assessment for Environmental Education in Florida: Florida Environmental Educators', Scientists', and Natural Resource Administrators' Attitudes Toward Environmental Education in Florida. August 1997. 225pp.

Phase III: A Needs Assessment for Environmental Education in Florida: An Analysis of a Focus Group and Individual Open-ended Interviews. August 1997. 31pp.

Phase IV: A Needs Assessment for Environmental Education in Florida: Floridians' and Tourists' Opinions and Attitudes toward Environmental Issues and Environmental Education. January 1998. 215pp.

This project was funded by the Advisory Council on Environmental Education (ACEE), Florida Game and Fresh Water Fish Commission, Grant Agreement 96043. We greatly appreciate the valuable assistance on and support for this project from Ms. Jerrie Lindsey and Ms. Madeline Strong of ACEE and the cooperation of the League of Environmental Educators of Florida (LEEF) and Florida State University.

General Considerations of Environmental Education

Let no man jump to the conclusion that Babbitt must take his Ph.D. in ecology before he can 'see' his country. On the contrary, the Ph.D. may become as callous as an undertaker to the mysteries at which he officiates. Like all real treasures of the mind, perception can be split into infinitely small fractions without losing its quality. The weeds in a city lot convey the same lesson as the redwoods; the farmer may see in his cow-pasture what may not be vouchsafed to the scientist adventuring in the South Seas. Perception, in short, cannot be purchased with either learned degrees or dollars; it grows at home as well as abroad, and he who has little may use it to as good advantage as he who has much. - Leopold, 1949:174

The literature indicates that there are two major views of environmental education.

Environmental education may be formal or informal education about the natural environment (Kellert, 1996:210-213). This definition covers the biological and earth sciences and topics such as Ecology, Natural History, Wildlife Management, and may be extended to topics such as Environmental Ethics, Environmental Policy, and recently, Natural Resource Economics (Daly, 1996). This type of education has been championed in many areas and is probably the most generally accepted definition of environmental education (Kellert, op cit.). The other definition

of environmental education is more complex. David Orr (1992, 1994) holds that all education is, or should be, environmental, in the sense that it ought to be acquired within the context of human environments, both natural and built (also see Bookchin, 1991). Although this seems relatively straightforward, the only examples of non-environmental education would be the pure theoretical sciences such as the abstract math disciplines or cosmological physics. However, as Orr (op cit.) uses the term, he is referring to educational reform as well as content.

Environmental education is not a single discipline or curriculum, but rather a broad complex of educational topics and forms. Environmental education takes into account the physical setting of education as well as the subject matter. Environmental education places importance on the manner of instruction along with content. Environmental education stresses experience with the natural world as a component of understanding and thinking. Finally, environmental education is directed at the outcome or actions which will provide the learner with the skills to build a sustainable society. In this form, environmental education strives to produce an informed citizenry capable of making responsible decisions about the interactions of human culture and natural resources. This definition has a definite action component. This latter element of action or behavioral change, however, has been the source of debate in the context of environmental education. Some have criticized the elements of action and behavioral change. For examples see Bailey (1993), Chase (1996), Poore (1993), Lewis and James (1995), Sanera (1996), and others in Fairman et al. (1994:207-249).

On the other hand, some criticism has come from within the environmental education community, charging that environmental education is not directed enough at behavioral change (Van Matre, 1984). We will not summarize the arguments here as they are not all entirely germane to this report. In general however, the complaints center on the use of false claims of environmental disasters, poor science, and, most importantly, propagandizing and politicizing students. We will address these last two issues elsewhere in this report. The environmental education community has not been blind to these charges, and the North American Association for Environmental Education (NAAEE) has prepared a detailed response in the form of guiding principles, professional responsibilities, and a code of ethics for environmental educators (in draft, not available for citation at this time). These recognize the unique role of action and

involvement in environmental education, but emphasize the need for objectivity, critical thinking, and personal decision making as legitimate outcomes. These also recognize the role environmental education plays in the promotion of general literacy.

Environmental education is also viewed as both a goal and a tactic of environmental organizations, both governmental and non-governmental (Dunlap and Mertig, 1992). A broad spectrum of the American public supports environmental education, although they disagree upon the particulars and the appropriate subject matter (Kempton et al., 1995). Generally speaking, environmental education is accepted by the public, by environmental organizations, and by the educational community. These groups may disagree with specific issues under the rubric of environmental education, but the major concepts seem well accepted.

The definitional problem of environmental education has been long recognized (Disinger, 1983) and there has been some confusion as a result. Herein we do not advocate any particular point of view, but recognize that all contain worthwhile concepts. Thus, when we refer to "environmental education" we are both alluding to educational programs about the natural environment and educational programs within the context of environmental affairs and the role of environmentally trained educators in general education. William Stapp, frequently considered to be one of the seminal authors in the field of environmental education, believes that environmental education is seldom a "stand alone" subject matter, but is supplemental to other educational topics (Stapp et al., 1969). The Belgrade Charter on Environmental Education also takes this view (UNESCO, 1976). This is also the general idea as expressed by Disinger and Monroe (1994:3-7) and conveys the intent of the Tblisi Declaration on Environmental Education which also appears to be widely accepted: *Environmental education is a process of developing a world population that is aware of and concerned about the total environment and its associated problems, and which has the knowledge, skills, attitudes, motivation and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.*

- (UNESCO, 1978)

In this report we will be generally using this definition unless explicitly stating otherwise. We will discuss some general issues of environmental education needs and recent developments, and then discuss the issues as they relate to Florida environmental education issues.

First, there is the myth that ignorance is a solvable problem. Ignorance is not a solvable problem; it is rather an inescapable part of the human condition.

- Orr, 1994:8

Only on the assumption that nature consists of a finite, closed system with no emergent properties can the belief be sustained that increased knowledge results in less ignorance.

- Murphy, 1994:16

Context

Environmental education is closely linked historically and contemporarily with traditional outdoor, conservation or interpretative education (Chenery and Hammerman, 1984). These programs take place in a variety of settings, from campgrounds to summer camps to field sites, and are incorporated into other educational programs or as separate programs. Environmental education at this level is experiential and generally related to specific locations. The importance of outdoor, nature studies or wilderness education has also been noted as a psychological factor in overall learning (Roszak et al., 1995). In this report we will refer to this type of environmental education as "conservation" education or "interpretative" education because we recognize that well-defined borders do not exist within educational programs, and too narrow of a definition can hamper program development. Environmental education has also shifted to the formal sector in recent years. With the work of Stapp and others, environmental education has come to be recognized as a part of K-12, undergraduate, and post-graduate education (Weilbacher, 1991). In this report we will refer to "formal" environmental education as all aspects of classroom education which address environmental concerns. This may be infused topics in K-12, home-schools, general topics or major studies at universities, or pre-service and in-service training for teachers. However, this latter area of pre-service or in-service training will be addressed separately. Environmental education can also be non-formal (or informal, the terms may be synonymous) in that it occurs outside the classroom, but not in an explicit conservation setting. Kirkpatrick (1996) has included community-based programs under the classification of environmental education. There is a pitfall we would point out here. Many "educational" programs are, in fact, informational and may contain serious bias. There are no good criteria to

separate "education" from "information." However, we feel that education, in most cases, is relatively "value fair" in that it attempts to show alternate points of view and differing value systems. Ramsey et al. (1992) and Engelson (1985) have addressed the goals of environmental education especially in the K-12 curriculum. However, these goals seem acceptable to us for non-formal and conservation education as well: environmental education programs should be action oriented and continuous. This would allow educators and learners to experience environmental education at all levels and in all settings. Environmental education is best done experientially: learners gain more through participation. Environmental education is oriented to the future and to world-wide issues. Environmental education should address the widest spectrum of natural, built, technological, social, economic, political, cultural, moral, and aesthetic aspects of the environment as possible. Environmental education programs ought to be multi-disciplinary and deal with local, regional, national, and international issues. Finally, there is a need to make environmental education programs as fair and objective as possible: all points of view need to be explored and all values freely expressed.

It is generally recognized in the environmental education community that most programs will be based on state initiatives (Ramsey et al., 1992; see Holtz, 1996, for a recent review of state environmental education programs). This is due to the fact that because the Constitution of the United States does not specifically mention education, it is reserved to the states under the Tenth Amendment (see Disinger and Bousquet, 1982, for a review). This applies to education in general, and follows the history of educational reform. National initiatives will therefore be more in the area of assistance rather than program development, although environmental education has received special attention from the federal government in recent years (Disinger and Bousquet, *op cit.*). This seems to us to be the most reasonable approach. Local educators can best judge what issues and approaches are best in their specific situations. Finally, it is the conclusion of many that environmental education will work best when it is infused into existing programs rather than initiated as new or additional material (Monroe and Cappaert, 1994; see Iozzi, 1989, for a review). Given the demands on the modern classroom teacher, another required topic would be onerous, but environmental education as supplemental to existing curricula should enhance the teaching experience and gain greater acceptance (Simmons, 1989). This has long been a goal of environmental education, but the reality may be that environmental education has remained a

sub-set of science (Simmons, op cit.). One of the needs we will identify later is more work on environmental education infusion.

Content

Overall, probably any given subject can be taught as environmental education, but Stapp (1969:30-31), early on in the development of the field, outlined the general areas of concentration. One of the primary areas of environmental education is to convey that humans are inseparable components of biophysical ecosystems. Human cultures and humans as individuals are part of a biophysical environment and have the ability to alter this environment and the interrelationships within the system. Environmental education should convey a broad understanding of the biophysical environment, natural and built, and the role environment plays in modern societies. Environmental education is also problem oriented: how environmental problems challenge human culture and the responsibilities of humans in regard to these problems. Environmental education should enable learners to take part in the resolution of problems or in the enjoyment of the biophysical environment.

The Tblisi Declaration on Environmental Education (UNESCO, 1978) outlines the consensus ideas of the international environmental education community on broad areas of content. It calls for the adoption of criteria for the development of environmental education programs at all levels. It establishes goals for environmental education of fostering awareness, providing opportunities to acquire knowledge about the environment, and changing behaviors of individuals and groups toward the environment. The Declaration also calls for systematic evaluation, which we will address later, and the adoption of programs of assistance in environmental education, of which ACEE is a good example. The Tblisi Declaration on Environmental Education (UNESCO, op cit.) formalized the "Awareness to Action" model of environmental education. This model suggests that learners progress from general awareness of environmental issues, to knowledge through formal and non-formal education programs, to attitudes about the environment, to skills in dealing with environmental issues, to participation or action in solving environmental problems. The model can be inverted (Hammond and Bylsma, pers. comm.), suggesting that learners can be introduced directly to environmental action and

then directed by the accumulation of skills, the shaping of attitudes, and the acquisition of knowledge, to a personal awareness and internalization of environmental values.

Hungerford et al. (1980) have outlined the broad areas of content, especially in the formal K-12 curriculum. There is a need for basic ecological knowledge which includes the concepts of populations and individuals, interactions and interdependence, environmental influences and limitations, energy flows and material cycles, biological communities and biophysical ecosystems, homeostasis, ecological succession, human culture as a part of ecosystems, and the ecological implications of human actions. At a higher conceptual level, Hungerford et al. (op cit.) feel that human cultural activities should be examined in greater detail, the actions of individuals should be examined from an ecological viewpoint, a wide variety of environmental issues should be explored, critical thinking and decision making should be taught, the role of values, both personal and cultural, should be explored, and the need for responsible citizen action should be included in environmental education programs. Finally, Hungerford et al. (op cit.) feel that investigation, evaluation, and action skills should also be taught in environmental education programs.

Issues

Values and Morality

. . . Behind much of the criticism lies the belief that ethics is the realm of feeling and emotion: if there can be no objective truth in ethics, it may seem, there can be no scope for reason and argument. The premise is, of course, controversial; but even if we accept it, the conclusion does not follow.

- Singer, 1984:6

Few things are more charged than the issue of teaching values and morality in public schools. This topic can probably generate as much debate as any and is at or near the heart of education reform in the United States. This does not alter the fact that many authors routinely include morality and values as an essential part of environmental education. Kellert (1996:209-218), for example, includes ethics and education as largely inseparable issues. Rolston (1988:212-213 and 1989:108-109; also see various authors in: Callicott and da Rocha, 1996) considers environmental education both as an expression of value and morality, and value and morality as a goal of environmental education. Orr (1992, 1994) reiterates this claim and feels that morality

is a routine part of any environmental education program. Based on our review of the literature (Bissell, 1993:175 et seq.; also see: Pennock and Bardwell, 1994) it appears that the issue is morality or ethics as a consideration, not as a particular ideology. In other words, in general, environmental issues are not purely technical or scientific issues, but are also moral issues, involving conflict over basic values and can be resolved by recourse to ethical decision making. This does not imply any particular ethical or moral system, in fact, it could imply many moral systems, but rather that the issue and discussion of values is part of environmental debate (Rolston, 1994:217-234) and is, therefore, an essential part of environmental education programs. As we mentioned earlier, we feel that any attempt at "value neutral" education, especially in regards to environmental education, is very difficult, if not impossible. Environmental policy, by definition, involves differences over issues of value and is axiomatically an issue of ethical concern. The objective, therefore, of environmental education programs is to teach critical thinking skills so that ethical decision making is possible; not to teach a particular ethical method or espouse a certain moral system.

Evaluation and Assessment

Human propensities in the face of evaluation: feline curiosity; stultifying fear; beguiling of reality; ingratiating public acclamation; inscrutable selective perception; profuse rationalization of whys and why nots; and apocalyptic anticipation. In other words, the usual run-of-the-mill human reactions to uncertainty. . . Once past these necessary initial indulgences, it's possible to get on the real evaluation issues; What's worth knowing? How will we get it? How will it be used?. . . Meaningful evaluation answers begin with meaningful questions.

- Halcolm quoted by Hollums and Bissell, 1994.

Evaluation can occur at the program level: How efficient is the program? How well received? Or it can be outcome based: How effective is the program? Are the stated goals being met? Based on our review of the environmental education literature, neither of these types of evaluation are being done well, but both are being done to some extent (see Chenery and Hammerman, 1984 for an example). One of the reasons for the seeming lack of evaluation in environmental education is, as we have seen in the introduction to this report, a poor understanding of the basic definition and goals of environmental education. Another, especially germane to the ACEE, is that evaluation is very expensive, and the benefits are often ambiguous. Often experimental evaluation is recommended in education (Bennett, 1988). However, true experimental evaluations are very rare as far as we can see. Powell (1996) in Colorado and Dickey (1994) in

California are two recent examples of experimental evaluation. Both of these studies indicate that environmental education is meaningful when measured against specific outcomes and holds up as well as other curriculum supplements when measured against broad standards. These are essentially the same results as obtained by Bissell (1992) using quasi-experimental and qualitative techniques. In the final analysis, experimental evaluations of environmental education may be worthwhile for very specific programs, but have limited applicability over broad program analysis.

The current state of education reform in the United States is centered on the use of "Standards," "Outcomes," and "Student Achievements." The issue is important enough to have been included in President Clinton's recent inaugural address. However, it is beyond the scope of this report to consider all of the issues of modern education reform. Thus, we will limit our discussion to the specific area of environmental education evaluation and assessment. The basic conclusion is that there is not any single, good assessment device or evaluation protocol available at this time. This area is, therefore, identified as a basic need in environmental education (Hollums and Bissell, 1994) and is discussed later in the specific context of Florida environmental education programs. Hollums and Bissell (op cit.) were able to identify only 7% of the environmental education programs reported in the *Journal of Environmental Education* as having evaluation components. Their recommended approach called for environmental literacy testing at the 4th, 8th, and 12th grade levels (also see Orr, 1992, for a discussion of ecological literacy). In general, this approach would apply across programs, rather than to specific programs, and may be worthwhile investigating for entire systems, but it is probably not applicable to individual programs which would require more specific outcome evaluation, content evaluation, or program evaluation to be meaningful.

Roth (1989) has found that evaluation of traditional environmental education topics, such as basic science methods, yields questionable results. Her suggestions center on critical thinking and decision making rather than the accumulation of facts and traditional "knowledge" levels. This concept is probably best applied to the multi-disciplinary approach that has been suggested for environmental education. Newman (1991:460) has suggested three primary areas of assessment which can be applied to all education, including environmental education. One is the

assessment of prior knowledge base at each level of education. Another is the promotion of in-depth understanding of specific issues. The last is integration of knowledge into the routine of the learner's life. In Colorado, Hanophy (1996) has demonstrated how existing environmental education supplements can be correlated to state model content standards in science, math, social studies, language arts, geography, and other core topics. She has also suggested how environmental education supplemental material can be used to assess model content standards. This approach has the benefit of dove-tailing to mandated programs, assisting teachers in achieving existing standards, and not imposing additional standards and requirements. The NAAEE is in the process of developing model standards for environmental education (Simmons, in progress; not available for citation), but these will be informal and voluntary as compared to the mandated standards being adopted in many states and under discussion at the national level.

Multicultural and Urban Environmental Education

Now, how is virtue to be taught in the age of shopping malls and MTV? At the most basic level there is no substitute for role models, parents, teachers, and leaders who live virtuous lives. Nor is there any substitute for experiences that foster virtue and the discipline that goes with it. For all of their streetwise sophistication, the vast majority of young people have grown up in a kind of sensory deprivation chamber of the modern suburb or city.

- Orr, 1992:183

The literature identifies the area of multicultural learners and the urban setting as needing separate attention (Frank and Zamm, 1994; see various authors in Fairman et al., 1994:250-285). Given the diversity of Florida's population, this issue should be considered. The suggestions center on the fact that different cultures have different attitudes toward environmental issues and bring varying skills to the educational setting. Also, there is some suggestion that learners in urban settings have different perspectives on environmental issues. For example, Hollums and Bissell (1994) discuss the evidence that urban students tend to focus on environmental "problems", such as pollution, and rural students tended to focus on other, less anxiety producing aspects of environmental education, such as natural history of animals. In general, environmental education in urban schools seems to be less emphasized (Volk et al., 1984) than in rural schools. However, other studies (Bissell, 1992) have found that urban school children may have a greater sensitivity to environmental issues and a broader understanding of the issues. Whatever the case, the NAAEE has placed special importance on urban and multicultural education in recent years. For example, Wade (1994) reported fewer than 20 U.S. citizens of color at the NAAEE Annual

Conference in 1993, out of a total of more than 800 attendees. In general, the environmental education community views multicultural and urban environmental education as priority issues.

Assessing Environmental Education Needs

Determining the needs in an environmental education program is a daunting task. We have literally the entire biophysical world and all of human culture from which to choose. Thus, it should not come as a surprise that needs assessments tend to focus on small pieces of the big picture. The only agreement we find about the overall picture is that environmental education requires dedication of the classroom teacher, the interpreter, and the educator working in the non-formal arena (Bones, 1994). By and large, environmental education programs need funding and the cooperation of the community (Osborn, 1994). Childress (1978:10) felt that kindergarten and pre-school were the areas which needed the most focus. He also felt that state assistance was necessary for most programs. At the time Childress (op cit.) did his research, adequate environmental education curricula were not available. However, he found that teachers were able to utilize other material if given training. Support staff involvement in environmental education was identified along with funding. Disinger and Bousquet (1982) were especially concerned about the level of governmental support for environmental education. They believed that environmental education programs were spotty in terms of implementation and that research was needed to further establish the content and delivery of environmental education. They were especially convinced that state agencies needed to be active in formulation, development, and implementation of environmental education programs. Thus, support to state agencies involved with environmental education was indicated. As mentioned above, evaluation of all types of environmental education programs appears to be a consistent need (Chenery and Hammerman, 1984).

Both programmatic and outcome evaluations appear lacking in the literature. Often evaluations may be as simple as keeping basic statistics on participation or having participants give subjective evaluations. However, Walker (1995) found fewer than 50% of environmental education programs in Colorado have any evaluation component at all. Of those that did evaluate, evaluation consisted mainly of keeping figures on attendance or participant evaluation.

There were no outcome evaluations performed. The program respondents reported cost as the main barrier to outcome evaluation.

On content areas, Walker (op cit.) found that most programs described themselves as "general" environmental education. Wildlife education came second, and other programs ranged from recycling to biotechnology. None of the specific topic areas accounted for more than 10% of the programs being offered, and most specific topics were covered by less than 5% of the programs. While this may be taken as an indication of the relative importance of some areas, it is also indicative of a need for programs to address specific topics. Walker (op cit.) concluded that more attention needed to be directed at specific topics, such as ecotourism, biodiversity, endangered species, and such. She also concluded that little or no further work was needed in "general" environmental education programs or programs dealing with encompassing topics such as "wildlife" or "recycling."

One of the more general needs in environmental education is for infusion of environmental education across the various curricula (Ramsey et al., 1992). However, this has been poorly accomplished in most cases (Simmons, 1989; Bissell, 1992). Another need appears to be more emphasis on pre-service training in environmental education for all pre-service teachers. In a national survey, professional environmental educators felt that most of the goals of environmental education were not being met, although some, such as basic knowledge, were adequate (Volk et al., 1984). At the time of this study, there was a perceived need for new curricula in environmental education. Later studies, such as Bissell (1992), seemed to indicate that curricula are not being used and that there are many more curricula of a general nature than teachers can use.

A major need identified by Volk et al. (1984) and, more recently, Wade (1994), was increased emphasis on teacher in-service training. These needs were seen as more or less equal in formal, non-formal, and conservation education areas. Wade (op cit.:8-9) identified the need for professional training for environmental educators and for educators in other fields wanting to use environmental education materials. Wade (op cit.) also saw the need to link environmental education to education reform, in general.

It is important to note that this needs assessment addresses the needs of Florida adult residents and tourists in as broad a manner as possible. It does not address the needs of children. This topic has been covered elsewhere in Florida and many excellent sources of information on this topic are available. The ACEE may consider a separate needs assessment for children. There is some indication in the literature of "value neutral" environmental education. We do not use that terminology herein because we do not believe that it is either possible or practical to build an education program without recourse to value judgments. Rather, these programs should strive for objectivity and openness, but not neutrality.

Chapter 2: Major Findings

Florida Environmental Educators', Scientists', and Natural Resource Administrators' Attitudes Toward Environmental Education in Florida

The top five highest priority environmental issues in Florida requiring environmental education efforts according to Florida educators, environmental scientists, administrators, and biologists are issues related to:

1. water resources
2. land use/growth management
3. habitats/ecosystems
4. coastal protection
5. personal action.

Issues related to water resources, habitats and ecosystems, and land use and growth management were considered high or extremely high priorities by most educators, environmental scientists, administrators, and biologists (94% to 100%). Eighty percent to 90% considered issues related to coastal protection, personal action, and environmental legislation high or extremely high priorities.

- Specific issues within each of the highest priority topic areas focus on a few definitive themes.

Florida educators, environmental scientists, administrators, and biologists focused on a few definitive themes within each broad highest priority topic area. Respondents who considered an issue an extremely high priority were asked what specific issue, related to the broad issue, is an extremely high priority environmental education need. Respondents were allowed to list more than one specific issue for each high priority topic area. Specific issues related to water resources included: water conservation (48%), water quality (27%), water pollution in general (20%), information in general (8%), and drinking water (8%). Four percent or less mentioned: pesticide contamination, saltwater intrusion, water cycle, storm water, Everglades, wetlands, non-point source pollution, water pollution due to industrial discharge, and hazardous wastes. Specific issues related to land use/growth management included: the need for planning/habitat protection (47%), sustainable development (11%), the role of citizens in planning/legislation (9%), and urban sprawl (7%). Five percent or less mentioned: water management, carrying capacity, overpopulation, agriculture, coastal issues, information in general, and don't know. Specific

issues related to habitats and ecosystems considered extremely high priorities by respondents included: habitat loss and fragmentation (50%), information in general (11%), wetlands (9%), land use, acquisition, and management (8%), and biodiversity (5%). Three percent or less mentioned: rivers, lakes, estuaries, springs, and coral reefs. Specific issues related to coastal protection centered on beach preservation (31%) and development (24%). Other issues were considered less important but included erosion (9%), coral reefs (9%), sea turtles (7%), mangroves (4%), post-disaster redevelopment (4%), armoring (4%), and beach access (2%). Issues related to personal action were among the most diverse and widespread. Mostly, issues centered on encouraging citizens to act on behalf of the environment, the ability to make a difference, and the impact of individual actions.

- The most important sources of information about environmental education for Florida educators, administrators, and scientists are in-service workshops, continuing education courses, seminars, and conferences.

Seventy-three percent of Florida educators, administrators, and scientists said these were very important (a total of 94% said important). They are even more important to educators. Ninety-four percent of educators said in-service workshops, continuing education courses, seminars, and conferences are important (82% said they were very important), by far their most important information source.

- More than half (55%) of Florida educators, administrators, and scientists experience barriers which prevent them from utilizing environmental education resources or materials (45% do not experience barriers).

Those who experienced barriers were asked to specify what those barriers were. Barriers mentioned varied; however, several were mentioned repeatedly: lack of time (26%), lack of funding (26%), limited access to resources (12%), Internet problems (no access/difficult to use, 12%), and difficult to find available information/resources (7%).

- Florida environmental educators, scientists, and natural resource administrators feel that a majority of environmental education efforts should be focused on full-time residents.

Florida environmental educators, scientists, and natural resource administrators felt that 58% of efforts should be targeted toward full-time residents, 25% should be targeted toward part-time residents, and 17% should be targeted toward tourists.

- Florida environmental educators, scientists, and natural resource administrators feel that most environmental education efforts should focus on either local issues or Florida-specific issues.

The average respondent said that 42% of efforts should focus on local issues, 40% should focus on issues specific to Florida, and 19% should focus on global issues.

- Florida environmental educators, scientists, and natural resource administrators feel that slightly less than half of environmental education efforts should focus in formal settings.

Conservation or interpretive education takes place in a variety of settings, from campgrounds to summer camps to field sites, and is generally experiential and related to specific locations.

Formal environmental education takes place within K-12, undergraduate, and post-graduate education. Informal environmental education occurs outside of the classroom, but not in an explicit conservation setting. Florida environmental educators, scientists, and natural resource administrators felt that 44% should be offered in formal settings, 25% should be offered in informal settings, and 30% should be offered in interpretive settings.

- For formal environmental education efforts, Florida environmental educators, scientists, and natural resource administrators feel that middle/high school and elementary school students should be the highest priority target groups; for informal environmental education efforts the general population/everyone and K-12 school students; and for interpretive environmental education efforts middle/high school students, the general population/everyone, and elementary school students.

When asked who should be the highest priority target audience for formal environmental education efforts, 70% of Florida environmental educators, scientists, and natural resource administrators said middle school and high school (grades 7-12), 55% said elementary school (grades K-6), 20% mentioned undergraduate students, 16% said graduate students, and 6% said teachers. Respondents were allowed to list more than one target audience. Four percent or less mentioned adults, everyone/general population, and don't know. Five percent mentioned other answers. More educators felt that elementary students should be the highest priority target

audience for formal environmental education efforts than administrators (65% vs. 46%). These individuals were also asked who should be the highest priority target audience for informal environmental education efforts. Twenty-eight percent of respondents said everyone/general population, 21% said elementary school, 20% said middle school and high school, 14% said adults, 6% said senior citizens, and 6% did not know. Five percent or less said undergraduate students, new residents, voters, parents and families, graduate students, full time residents, part time residents, tourists, and the business community. Eight percent mentioned other answers. Florida environmental educators, scientists, and natural resource administrators were also asked who should be the highest priority target audience for interpretive environmental education efforts. Respondents were allowed to list more than one target audience. Thirty-six percent said middle school and high school, 31% of respondents said everyone/general population, 25% said elementary school, 10% said undergraduate students, 8% said tourists, 6% said graduate students, and 6% did not know. Five percent or less said adults, families, new residents, senior citizens, voters, and teachers. More educators felt that elementary students should be the highest priority target audience for interpretive environmental education efforts than administrators (34% vs. 18%).

- Most Florida environmental educators, scientists, and natural resource administrators feel 1) there is too little environmental education directed at behavioral change or the "action component", 2) it is appropriate to teach their audiences how to become involved in environmental actions, and 3) that their organization supports them in teaching their audiences how to become involved in environmental actions.

The majority of Florida environmental educators, scientists, and natural resource administrators (70%) said there is too little environmental education directed at behavioral change or the action component. Sixteen percent said there is about the right amount, 4% said there is too much, and 10% did not know. It was explained to respondents that by this we mean those environmental actions in which people work directly with the natural world, use monetary support or financial pressure, appeal to others, or use political means to help prevent or resolve environmental issues. Eighty-three percent agreed that it is appropriate for them to teach their audiences how to become involved in environmental actions (63% strongly agreed). Seventy-eight percent of respondents also agreed that their organization supports them in teaching their audiences how to become involved in environmental actions (46% strongly agreed).

- Most Florida environmental educators, scientists, and natural resource administrators feel that they have received the necessary training in environmental education to communicate effectively about the subject; they get the support they need from their organization to educate and inform the public about the environment; environmental education resources are available to them; and their organization has a clearly defined plan for providing environmental education.

Eighty-three percent of Florida environmental educators, scientists, and natural resource administrators agreed that they have received the necessary training in environmental education to communicate effectively about the subject (47% strongly agreed). More educators agreed that they have received the necessary training in environmental education to communicate effectively about the subject compared to administrators (57% vs. 38%). Eighty-two percent of respondents agreed that environmental education resources are readily available to them (46% strongly agreed). Seventy-eight percent of respondents agreed that they get the support they need from their organization to educate and inform the public about the environment (48% strongly agreed). Seventy-four percent of respondents agreed that their organization has a clearly defined plan for providing environmental education (41% strongly agreed).

- Florida environmental educators, scientists, and natural resource administrators feel that they only somewhat understand the public's environmental education needs.

Although 73% of environmental educators, scientists, and natural resource administrators agreed that they have a clear understanding of what the public's environmental education needs are, only 22% strongly agreed, indicating the comfort level of understanding Floridians' environmental education needs is moderately high.

- A majority of Florida environmental educators, scientists, and natural resource administrators disagree that Florida has a clearly defined plan for providing environmental education to its residents and tourists.

Only 22% of Florida environmental educators, scientists, and natural resource administrators agreed that Florida has a clearly defined plan for providing environmental education to its residents and tourists (2% strongly agreed). Fifty-eight percent of respondents disagreed that Florida has a clearly defined plan for providing environmental education to its residents and tourists (29% strongly disagreed).

- There is no major single barrier that has prevented Florida environmental educators, scientists, and natural resource administrators from conducting environmental education.

Florida environmental educators, scientists, and natural resource administrators were asked if there are any specific barriers which have prevented them from conducting environmental education. The most common answer was no (35%). Of those who experienced barriers, the most common barrier named was lack of funding (28%). Ten percent of those who experienced barriers mentioned a lack of time, and 8% said they do not have class time. Four percent or less mentioned: environmental education was not in their job description, there was a lack of preparation time, they needed more opportunity to take their audience outside, there was no access to environmental education resources, or they needed more interest from their audience.

Floridians' and Tourists' Opinions and Attitudes Toward Environmental Issues and Environmental Education

Floridians' and Tourists' Opinions on Funding for Environmental Protection and Environmental Education

- Floridians and tourists support increased funding for the State of Florida to prevent and correct environmental problems.

More than two-thirds of Floridians (70%) said they think the State of Florida should direct more time and money to preventing and correcting environmental problems. Specifically, 30% said much more, 40% said somewhat more, 19% said the same level of effort, 3% said somewhat less, 1% said much less, and 8% said don't know when asked if the State of Florida should direct more, the same, or less time and money to preventing and correcting environmental problems. Although also very supportive, tourists were less likely than Floridians to say the state should direct more time and money to preventing and correcting environmental problems (60% vs. 70%).

- A strong majority of Floridians and tourists support increased funding for environmental education.

No one knows enough about these things. We know what the problems are, we don't know what causes the problems, what are the regulations. We need education, consumers, neighbors, communities, whatever. We're not educated enough, we need education so that we can recycle properly. If we knew what the problems were, we'd get more involved.

- Florida resident

I'm sure there are a lot of issues; air and water. It's pretty good where we go, but we're tourists, you're not going to run into problems where we go.

- Florida tourist

I don't know if (pollution control) should go crazy. A little pollution isn't a terrible thing. . . We don't live in a perfect world, we never will.

- Florida tourist

Over two-thirds of Floridians (72%) said they think the State of Florida should direct more time and money to educating residents about Florida's environment. Specifically, 32% said much more, 40% said somewhat more, 19% said the same level of effort, 3% said somewhat less, 1% said much less, and 6% said don't know when asked if the State of Florida should direct more, the same, or less time and money educating residents about Florida's environment. Although similar percentages of tourists and residents said the state should direct more effort overall to educating residents, tourists were more likely to say much more to this question (41% vs. 32%).

- Almost all Floridians and tourists support the goals of the Advisory Council on Environmental Education (ACEE).

There must be some kind of environmental program, or some teachers must emphasize it. I just graded papers for 8th graders throughout the state. The topic was, "How would you make the United States a better place." And, I'd say two out of three of the students would say "the environment." (It was) a statewide contest.

- Florida resident

When we went to school we didn't have programs like that. Now you hear about Earth Days, I think kids are getting educated more, participating more, it's almost mandatory, whatever age, being out there participating in those clean up sessions.

- Florida resident

Everybody (needs environmental education), we all have a vote, we do have a say, as little as it is. If enough people were educated, we'd insist on our leaders doing what we think they should do. It can turn things around.

- Florida tourist

In the survey, respondents were informed that the ACEE is part of the Florida Game and Fresh Water Fish Commission with the goal of educating Floridians and tourists about Florida's environment. A vast majority of Floridians (85%) supported the goals of ACEE. Specifically, 44% strongly supported, 41% somewhat supported, 4% neither supported nor opposed, 2%

somewhat opposed, 1% strongly opposed, and 13% said don't know when asked for an opinion of the goals of ACEE. Although tourists and residents equally supported the goals of ACEE overall, tourists were more likely than residents to strongly support the goals of ACEE (61% vs. 44%).

Floridians' and Tourists' Opinions of Florida's Environmental Health

- A majority of Floridians feel that Florida's environment is healthy, although about a third feel it is somewhat unhealthy. Tourists are more likely to feel Florida's environment is healthy.

I don't know that much about Florida. From what I've seen it doesn't seem as bad as other places as far as smog and pollution.

- Florida tourist

There's the land around Miami, what's it called? The Everglades, that's a long way from Tampa. . .The Everglades used to be a great swamp, but they've encroached on it. The sugar interests down there, they've drained the swamp and hurt the water, but it's still functioning, I don't consider it a huge insurmountable problem. . .The Everglades, being a natural aquifer, it should have a certain level, you get down in the southeast section, there's such a huge population, I assume that is where their water is drawn from, the Everglades, if you've ever been through there, they've got a lot of canals, and the water level has gone down and that is an environmental issue down there. . .80% of the water (in the Everglades) is used by industry, the sugar industry.

- Florida resident

A majority of Floridians (60%) said they would describe Florida's natural environment as healthy, in general. Specifically, 12% said very healthy, 48% said somewhat healthy, 26% said somewhat unhealthy, 8% said very unhealthy, and 7% said don't know when asked to describe the health of Florida's natural environment. Tourists were more likely than the resident sample to describe Florida's natural environment as very healthy (46%). Of those who described Florida's natural environment as healthy, 30% felt that way because "it looks healthy" while 14% said the environment looks "green and lush." Respondents who described Florida's natural environment as unhealthy were asked for their main reason for this opinion. Forty-eight percent of Floridians who described Florida's environment as unhealthy did so because of water pollution, while 21% mentioned development or habitat loss. Seventeen percent mentioned air pollution, and 17% said overpopulation or there are too many people. Nine percent said industry doesn't care or industrial pollution, 7% see lots of litter, while 5% said individuals don't care. Five percent of respondents

who described Florida's natural environment as unhealthy said they don't know why they feel this way. Many other reasons were mentioned, but none by at least 5% of respondents.

Floridians' and Tourists' Opinions on the Most Important Environmental Issues Facing Florida

- Water resource issues are considered by more Floridians to be the most important issue facing Florida than any other issue.

The water is lousy. . .Mostly the water in Florida comes from underground wells. In the mid-west water comes from lakes and rivers, so down here you're going to see a harder water. . .I would say (water is) an environmental problem because the water has to be cleansed. There is so much trash and waste dumped into the water. It's suppose to be cleansed thru whatever system, but it's not being done properly. As a result, I don't drink the water out of the faucet, I don't drink it at work, I buy water at home, I don't have it installed, but I should. It tastes like rust. . .The authorities claim the water is good as far as drinking is concerned, it doesn't taste very good and I drink bottled water, the water around here comes from the Florida aquifer, an underground puddle and it's been damaged from over dumping. We build too much; roads, and now the ground that used to catch the water, it just runs off. I think there's plenty of water here if we want to purify it, but I don't know how you're going to get around the taste.

- Florida resident

We do have other water problems, once or twice a year you hear about dead fish, some microbe. That's because we're on the gulf side and everything from Canada on down gets flushed out the mouth of the Mississippi (River) and comes right down here. It's just a huge toilet, all the pesticide(s) they're putting on the land, it goes in and comes down here. We get stuff in the water and it kills the fish, it makes it really bad.

- Florida resident

I'm from Jersey, I don't know a lot about Florida. I see a few waterways that look like they are polluted. I came in from Jacksonville and I saw some waterways that looked polluted. I have no idea if something is being done about them. I didn't see any work when I passed them.

- Florida tourist The thing that bothers me more than anything is to think the drinking water is polluted. I know there are other things. Number one, the wildlife and the fishing, they keep polluting the water, if they keep doing it we won't have any fish to eat. If you don't straighten up, it's a concern for our lives, the drinking water.

- Florida tourist

The major importance of water resource issues emerged from the surveys in numerous ways, and in fact, were the dominant issue of the survey findings. In an open-ended question, water pollution was considered to be the most important issue facing Florida by more Floridians than any other topic. In fact, when water pollution and lack of water answers (unaided answers) were combined, water resource issues were two and one half times higher than the second highest

issue, which was "don't know." Water resource issues were so dominant that they were five times more likely to be mentioned as the most important environmental issue than development and habitat loss issues combined. In a series of close-ended questions on the relative importance of water resources, water resource issues were considered to be the highest priority by more Floridians than any other issue (86% said it was a high or extremely high priority [34% characterized water resource issues as an extremely high priority]), over and above issues related to land use, growth, and development; habitats and ecosystems; coastal protection; and endangered species. Among the Floridians who felt that Florida's natural environment was unhealthy, water pollution was by far their main reason for describing Florida's environment as unhealthy. In the focus group of Floridians in Tampa, the issue of water pollution was the only specific problem which arose without prompting. Finally, more Floridians are interested in learning more about water resources than any other environmental topic. Twenty-three percent of the resident respondents said "water quality" when asked what specific issue related to water resources is the most important environmental issue in Florida today. Eighteen percent said water pollution in general, 11% said water conservation/lack of water, and 8% said water quantity. Twenty percent did not know what specific issue related to water resources is the most important environmental issue in Florida today. Many other issues were mentioned, but none by at least 5% of respondents.

- Endangered species is considered another top environmental issue in Florida. However, most Floridians (three-quarters) do not see habitat loss, fragmentation, or development as the most important problem when it comes to endangered species in Florida. Additionally, other than information on water resources, more Floridians want more information on endangered species than any other topic.

Interestingly, in the open-ended question on the most important environmental problem facing Florida, endangered species was not mentioned often. One reason may be that Floridians do not equate the issue of endangered species as an "environmental" problem. However, in the closed-ended question, endangered species issues ranked second of the five issues presented to respondents -- water resources, endangered species, land use/growth and development, habitats and ecosystems, and coastal protection. More than one-quarter of Floridians (28%) thought environmental issues related to endangered species should be an extremely high priority for the direction of the State's environmental education efforts. More than one-third (39%) said

endangered species should be a high priority, 24% said medium priority, and 8% said low priority. Two percent did not know. When compared to residents, tourists were more likely to say issues related to endangered species are a high priority (54% vs. 39%). Less than one-quarter of respondents (23%) said development/habitat loss when asked what specific issue related to endangered species is the most important environmental issue in Florida today. Nineteen percent said protecting them from extinction, 12% said being harmed by humans, and 6% said pollution. Twenty-three percent did not know what specific issue related to endangered species is the most important environmental issue in Florida today. Many other issues were mentioned, but none by at least 5% of respondents.

- Issues related to coastal protection; land use, growth management, and development; and habitats and ecosystems are all considered important issues facing Florida's environment.

Coastal protection

More than one in five Floridians (22%) thought environmental issues related to coastal protection should be an extremely high priority for the direction of the State's environmental education efforts. Half said coastal protection should be a high priority, 21% said medium priority, and 3% said low priority. Four percent did not know. When compared to residents, tourists were more likely to say issues related to coastal protection are a high priority (61% vs. 50%), and tourists were less likely to say don't know to this question (1% vs. 4%). More than one-quarter of respondents (28%) said beach erosion when asked what specific issue related to coastal protection is the most important environmental issue in Florida today. Sixteen percent said development, 15% said pollution, and 17% did not know what specific issue related to coastal protection is the most important. Many other issues were mentioned, but none by at least 5% of respondents.

Land use, growth management, and development

Twenty percent of Floridians thought environmental issues related to land use, growth, and development should be an extremely high priority for the direction of the State's environmental education efforts. Half said land use, growth, and development should be a high priority, 23% said medium priority, and 4% said low priority. Three percent did not know. When compared to residents, tourists were less likely to say issues related to land use, growth, and development are

an extremely high priority (13% vs. 20%) or a medium priority (14% vs. 23%), and tourists were more likely to say land use, growth, and development issues are a high priority (68% vs. 50%). Thirty-two percent of respondents said over development when asked what specific issue related to land use, growth, and development is the most important environmental issue in Florida today. Seventeen percent said lack of planning/habitat protection, and 8% said overpopulation. Twenty-six percent did not know what specific issue related to land use, growth, and development is the most important environmental issue in Florida today. Many other issues were mentioned, but none by at least 5% of respondents.

Habitats and ecosystems

Nineteen percent of Floridians thought environmental issues related to habitats and ecosystems should be an extremely high priority for the direction of the State's environmental education efforts. Less than half (48%) said habitats and ecosystems should be a high priority, 23% said medium priority, and 4% said low priority. Six percent did not know. When compared to residents, tourists were more likely to say issues related to habitats and ecosystems are a high priority (63% vs. 48%), and tourists were less likely to say don't know to this question (1% vs. 6%). Thirty-one percent of respondents said development/habitat loss/habitat fragmentation when asked what specific issue related to habitats and ecosystems is the most important environmental issue in Florida today. Eight percent said the Everglades, while 5% said protecting wildlife and endangered species. Thirty-five percent did not know what specific issue related to habitats and ecosystems is the most important environmental issue in Florida today. Many other issues were mentioned, but none by at least 5% of respondents.

Floridians' and Tourists' Knowledge of Environmental Issues

- Most Floridians report knowing a little to a moderate amount about environmental issues, in general, in Florida. Few report knowing a great deal or nothing about environmental issues in Florida.

Ten percent of Floridians said they know a great deal, 40% said a moderate amount, 44% said a little, and 6% said they know nothing about environmental issues in Florida. The tourist sample was less informed than the resident sample. Tourists were more likely to say they know nothing (24%) or a little (54%), and tourists were less likely to say they know a great deal (5%) or a moderate amount (17%).

- A majority of Floridians report knowing a little to nothing regarding specific environmental issues, including issues related to 1) water resources, 2) growth and development, 3) habitats and ecosystems, 4) coastal resources, 5) endangered species, and 6) taking action on behalf of wildlife.

Sixty percent of Floridians reported they know a little to nothing about environmental issues related to water resources, 57% reported they know a little to nothing about environmental issues related to growth and development, 60% reported they know a little to nothing about environmental issues related to habitats and ecosystems, 61% reported they know a little to nothing about environmental issues related to coastal resources, 57% reported they know a little to nothing about environmental issues related to endangered species, and 64% reported they know a little to nothing about actions they can take related to environmental issues and problems. Overall, tourists' self-reported knowledge levels of these specific environmental topics were similar to Florida residents.

- Eighty-six percent of Floridians cannot name an endangered species native to Florida other than the Florida panther or manatee.

Only 14% of Floridians could correctly identify an endangered species other than the Florida panther or manatee. Thirty percent tried to name an endangered species, but were incorrect, while 56% answered no, they could not name an endangered species besides the Florida panther or manatee.

- The overall conclusion on Floridians' and tourists' knowledge levels from the telephone survey, focus group, and in-person interviews is that, in general, although there is a high level of concern over one or two environmental topics, there are very low levels of awareness or factual information over the broad range of issues.

Low levels of knowledge were evident throughout this needs assessment, including self-reported knowledge levels. Although we rarely see high levels of factual information from studies of general populations, the low levels of knowledge on even reasonably high-profile, glamour topics, such as endangered species, is somewhat surprising, considering there seems to be numerous other high-profile endangered species in Florida, including the Key deer, peregrine falcon, American crocodile, Schaus's swallowtail butterfly, or the hawksbill, ridley, or leatherback turtles. Taking into account the alarming rate of habitat loss and its impact on

endangered species in Florida, consider that only less than a quarter (23%) of Floridians stated that either development or habitat loss was the most important environmental problem when it comes to endangered species in Florida.

Floridians' and Tourists' Environmental Behavior and Propensity to Act on Behalf of the Environment

- A majority of Floridians have made at least one change to their lifestyle in an effort to address an environmental problem affecting Florida. The major lifestyle change is recycling.

Seventy percent of Floridians said they have made changes to their lifestyle in an effort to address an environmental problem affecting Florida. As well, 31% of tourists said they have made changes to their lifestyle, while in Florida, in an effort to address an environmental problem affecting Florida. Respondents who said they have made lifestyle changes were asked what lifestyle changes they have made in order to help the environment. Sixty-five percent of Floridians who have made changes are recycling. Twenty-six percent of Floridians who have made changes are conserving water inside the home, while 24% are not littering or are picking up litter. Ten percent of Floridians who have made changes are conserving water outside the home by using native plants/xeriscaping, 10% are properly disposing of hazardous waste, 9% are conserving energy, and 6% have stopped using fertilizer or pesticides. Many other specific lifestyle changes were mentioned, but none by at least 5% of those who said they have made changes. All respondents were asked what has prevented them from making changes so that their lifestyle is more environmentally friendly. Respondents were not prompted with specific barriers, and were allowed to name more than one response. Thirty percent of Floridians said nothing has prevented them from making lifestyle changes. Twenty percent of Floridians said they don't know what to do to help the environment, 9% said they don't have time or are too busy, while 7% said it is too difficult. Other barriers were given, but none by at least 5% of respondents.

- Besides recycling, the second most popular form of environmental action among Floridians is donating money to an environmental cause. Just under one-half of Floridians have volunteered for an environmental cause, attended a meeting, written a letter in support of an environmental issue, or called or visited a government official on behalf of an environmental issue.

Survey respondents were presented with a list of activities and asked if they participated in any in Florida during the past two years. Thirty-three percent donated money to an environmental organization or cause. Seventeen percent of Floridians volunteered time for an environmental cause, 15% attended a meeting concerning environmental issues, and 11% wrote a letter in support of environmental issues. Eight percent of Floridians called or visited a government official to discuss an environmental issue.

- A majority of Floridians are very likely to recycle household waste within the near future. Although many are somewhat likely, one quarter or less of Floridians are very likely to do any one of the following: donate money to an environmental cause, volunteer time for an environmental cause, attend a meeting, write a letter in support for an environmental issue, teach a class or give a lecture about environmental issues, or call or visit a government official to discuss an environmental issue within the near future.

The vast majority of Floridians (92%) said they would be likely to recycle household waste, while more than half (57%) said they would be likely to donate money to an environmental organization or cause in the near future. Between one-third and one-half of Floridians said they would be likely to write a letter in support of environmental issues (37%), attend a meeting concerning environmental issues (49%), or volunteer time to an environmental cause (48%) in the near future. About one in five Floridians said they would be likely to call or visit a government official to discuss an environmental issue (22%), or teach a class or give a lecture about environment issues (20%) in the near future. The likelihood for future participation in two activities was also measured for the tourist sample. Eighty-eight percent of tourists said they would be likely to recycle waste, such as glass, aluminum, or newspapers, while in Florida. Thirty-five percent of tourists said they would be likely to donate money to a Florida-based environmental organization or cause within the near future.

- Floridians who hunt, sail, have a college degree or higher, fish in salt water or fresh water, boat, visit a park, or are between the ages of 45 and 54 are more likely to act on behalf of environmental issues than other groups.

Residents with a high school education or less, non-voters, people who have lived in Florida less than 5 years, and adults younger than 24 years of age are the least likely to act on behalf of the environment.

Sources of Information on the Environment and Floridians' Interest in Information on Environmental Issues

- Newspapers are the most important source for information about Florida's natural environment. Television is also an important source.

Thirty-six percent of Floridians said they have received information about Florida's natural environment over the past five years from newspapers. Twenty-eight percent cited television, 12% said brochures or pamphlets, 10% mentioned magazines, 10% named a state agency, 5% referred to personal experience, and 5% said private conservation groups have served as information sources over the past five years. Twenty-seven percent of Floridians said they have not received information about Florida's natural environment, while 5% said don't know. Other information sources were mentioned, but none by at least 5% of respondents.

- A majority of Floridians are interested in learning more about the environment. Water resources is the most popular topic on which Floridians want more information.

Sixty-one percent of Floridians said yes, there are environmental topics about which they would be interested in learning more. Thirty-nine percent of the tourist sample said there are environmental topics about which they would be interested in learning more, while in Florida. Respondents who said yes, there are environmental topics about which they would be interested in learning more, were asked for specific topics. Thirty-four percent of Floridians who are interested in learning more about the environment said they are interested in topics related to water resources. Just under one-quarter (24%) of Floridians who are interested in learning more about the environment said endangered species, 13% said pollution, 12% said coastal habitat, and 11% said land use/growth management when asked for specific topics about which they would be interested in learning more. Nine percent of Floridians who are interested in learning more about the environment said habitat loss/fragmentation, 8% said recycling, 7% said the Everglades, 7% said all topics, 6% said ecosystems, 5% said wetlands, and 5% said population growth when asked for specific topics about which they would be interested in learning more. Five percent of Floridians who are interested in learning more about the environment said don't know when asked for specific topics about which they would be interested in learning more. Many other topics were listed, but none by at least 5% of Floridians who are interested in learning more about the environment.

- Direct mail, television, and newspapers are considered by Floridians to be the best way to provide them with information on environmental issues.

In an open-ended manner, survey respondents were asked what is the best way to provide them with information about environmental issues. Respondents were not prompted with potential mediums, and were allowed to name more than one method. Forty-four percent of residents said direct mail is the best way to provide them with information about environmental issues. Thirty-eight percent said television, while 33% said newspapers are the best way to provide them with information about environmental issues. Seven percent said radio, and 7% said magazines. Five percent did not know the best way to provide them with information about environmental issues. Many other methods were mentioned, but none by at least 5% of respondents.

Chapter 3: Implications and Recommendations

Implications

This project comprises one of the most exhaustive reviews, data collections, and analyses to date of Floridians' and tourists' environmental education needs. While there are numerous important and salient individual points, five factors are evident. First, Florida environmental educators, scientists, administrators, Floridians, and tourists share the common value that environmental education is an important and worthwhile activity. Second, the most important issues for the direction of environmental education efforts in Florida are water resources, land use/growth management, habitats and ecosystems, coastal protection, and personal actions. Third, Floridians are concerned with environmental issues, support environmental protection and environmental education programs, but have a low level of information about the environment, even at the most basic level. Fourth, water resource issues are currently the most important and salient environmental concern to Floridians. Finally, environmental action programs can and should be a part of most environmental education programs in Florida. Floridians can and will act on behalf of the environment as the high degree of recycling currently attests.

Recommendations

- The ACEE and the Florida environmental education community should focus on five broad topic areas:
 1. Water resources
 2. Land use and growth management
 3. Habitats and ecosystems
 4. Coastal protection
 5. Endangered species

Within each broad topic areas, a two-pronged approach is recommended; one that includes action issues and another that includes a concern component. Specific programs should either 1) target groups that are concerned with programs that include an action component, or 2) target groups that are least concerned and aware, with messages that focus on why these groups should care. Specific recommendations on target groups and messages are included under each topic area below. Projects should focus on only one, two, or three target markets. The ACEE and the Florida environmental education community should discourage programs and projects that have unspecified target groups or refer to their target market as "everyone" or "Floridians." Water resource issues were extremely important to Florida environmental educators, scientists, and

natural resource administrators. Issues related to water resources were also the most important and salient issue to Floridians. A major portion of environmental education efforts in Florida should be focused on water resource issues. Land use/growth management and habitats and ecosystems are also important issues in need of environmental education, according to Florida environmental educators, scientists, and natural resource administrators. They are also important to Floridians. These two topic areas should be given a sufficient allocation of resources, certainly more than coastal protection and endangered species, but not as much as water resource programs. Finally, coastal resource programs, endangered species programs, and unspecified projects should be allocated some resources. Although endangered species programs are not a high priority for Florida environmental educators, scientists, and natural resource administrators, endangered species programs are important to Floridians and tourists, especially among younger Floridians. Though topic focus is important, ACEE should reserve some resources for other topic areas other than those recommended above for two reasons: 1) There are many excellent and creative programs that do not fit under the broad topic areas recommended, and 2) program plans that are too rigid are often impaired by individuals who have interests other than the recommended topic areas.

- All programs within each broad topic area should target specific groups with specific messages. The recommended target groups and messages follow under the specific topic areas. The ACEE and the Florida environmental education community should encourage programs to target specific target groups with specific messages.

Water Resources

Water resource issues are a dominant topic area among Florida environmental educators, scientists, and natural resource administrators. It is also the most salient and important topic area for Floridians. Water resources should also be a dominant topic area among ACEE and Florida environmental education projects. Specific water resource topic areas should include the following: a major emphasis should be on 1) water conservation, 2) water quality, and 3) water pollution, in general. Other topic areas should be industrial discharges, sewage, septic tanks, storm water, underground storage tanks, injection wells, saltwater intrusion, and toxic/hazardous wastes. Programs must include, and possibly emphasize, the importance of water to human health. Past research by Mark Damian Duda & Associates indicates that public support is highest on environmental issues when the issue is directly related to human health. The following groups

are the most likely to feel that environmental issues related to water resources are an extremely high priority, and therefore, most likely to undertake action on behalf of Florida's environment:

1. Sailors
2. Residents with graduate or professional degrees
3. Fresh water anglers
4. Residents with college degrees
5. Residents aged 35-44
6. Residents who have lived in Florida 5-9 years
7. Residents aged 55-64

The following groups are the least likely to feel that environmental issues related to water are an extremely high priority. Programs may consider focusing on developing a concern for water resources and their importance to human health:

1. Residents aged 65 and older
2. Part-time residents
3. Residents with high school diplomas
4. Residents without high school diplomas

Tourists were left out of the recommended target groups because they represent a unique challenge for the environmental education community. Although tourists placed less emphasis on water resources, we do not recommend programs that create concern over water quality among tourists. Many tourists come to Florida for the water; water pollution or quality programs for tourists may not be supported by the tourism community. Instead, environmental education programs should focus on water quantity with this group as well as water conservation.

Residents aged 55-64 should be noticed here. Generally positive attitudes toward environmental issues decrease as age increases. Water resource issues appear to be one area ACEE and the Florida environmental education community could tap in to the concern of the older individuals and draw them in to the larger environmental arena. A major problem with environmental education programs, especially programs that teach responsible environmental behavior, is that there is rarely any feedback to the students or recipients of the program and messages that their actions are having an impact on the environmental problem. Water resource environmental education programs have a unique opportunity to do this. Water quality and quantity appear to lend themselves well to this type of feedback of the results of environmental action. Water resource conservation education action programs should build upon the great success of the past decade's recycling programs. We recommend projects that develop "water recycling" programs

and action items. Florida could lead the nation in water conservation education by developing and implementing a "water recycling" program of the magnitude of the newspaper and other household product recycling programs. The jump off point for such a program is the fact that most Floridians now recycle household waste. Finally, we recommend that the Florida environmental education community consider developing a major campaign in Florida focused on water quality, quantity, and conservation, and consider using this as the centerpiece or umbrella campaign that would tie together all environmental education efforts in the state. Part of this would be the development of a water conservation logo, perhaps playing upon the current recycling logo.

Land Use and Growth Management

Environmental education programs on land use and growth management was as important a topic as water resources to Florida educators, scientists, and natural resource administrators. Specific topic areas for environmental education efforts should emphasize the need for planning and habitat protection, sustainable development, the role of citizens in planning/legislation, and urban sprawl. One of the more interesting and surprising findings of this study was the general lack of awareness of, and any degree of major concern over Florida's growth and development. In the focus group and personal interviews, population growth and overpopulation issues only showed mixed concern. There was not a clear distinction between total population levels in Florida as opposed to the distribution of population. In the survey, only slightly more than 1 in 10 (11%) Floridians stated that development, habitat loss, or population growth was the most important environmental issue facing Florida. Even when asked what the second most important environmental issue facing Florida was, only 9% mentioned a topic related to development, habitat loss, or population growth (while the highest answer was "don't know" at 30%). Our findings indicate that Floridians just aren't putting together the fact that Florida's population growth and subsequent development are an important cause of environmental problems in Florida. This is in stark contrast to the fact that growth issues and management was a top concern for Florida environmental educators, scientists, and natural resource administrators. These educators, scientists, and administrators should realize that population growth and overpopulation issues do not receive the same level of saliency among Floridians or tourists as they do among environmental professionals. Concern about these issues, even to some extent any

great awareness, should not be taken for granted as one develops environmental education projects and programs. The following groups were the most likely to feel that environmental issues related to land use, growth, and development are an extremely high priority, and therefore, most likely to undertake action on behalf of Florida's environment:

1. Residents with graduate or professional degrees
2. Residents aged 25-34
3. Independent voters
4. Sailors
5. Fresh water anglers
6. Residents aged 45-54

The following groups were the least likely to feel that environmental issues related to land use, growth, and development are an extremely high priority. Programs should consider focusing on developing an understanding of the impacts of growth on Florida's natural environment.

1. Residents aged 65 and older
2. Residents aged 18-24 years old

Percent of (group) who said environmental issues related to land use, growth and development
Age appears to be linked to attitudes toward growth and development in an interesting way. The oldest of age groups as well as the youngest of age groups had the least percentage of individuals that felt land use, growth management, and development are an extremely high environmental priority. Yet, Floridians aged 25-34 were one of the most concerned age groups. It appears that increased environmental education programs targeted to 18-24 year olds on this issue would be well received since concern increases dramatically in the 25-34 year age group. Land use and growth management programs for 18-24 year olds should consider linking environmental education programs and messages on this topic to the issue of endangered species since endangered species are a major concern for this group. Showing the relationship between over development and habitat destruction to endangered species would be well received with this group. It is clear that programs targeted at senior citizens (65 years old and older) pose unique challenges to the environmental education community. This group showed the least concern for land use, growth, and development issues. Experimental and "trial" environmental education programs to foster environmental concern should be developed, implemented, and evaluated for their impacts and results. Once again, tourists have been left out as a target market here for the same reasons as stated in the section on water resources.

Habitats and Ecosystems

Environmental education programs related to habitat and ecosystem issues were a high priority for a slight majority of Florida environmental educators, scientists, and natural resource administrators. Programs should emphasize habitat loss and fragmentation, by far the most important subject area here according to the Florida environmental community. Other topic areas should include information in general, wetlands, and land acquisition and management. The Everglades is a top-of-the-mind issue with many Floridians, and should be considered as a jump off point or as an example when teaching Floridians about habitat loss and fragmentation (as well as water resource issues). The Everglades, after water pollution, was ranked as the second highest identified priority as the most important environmental issue facing Florida by Floridians (the Everglades was ranked in order, after water pollution and don't know). The following groups were the most likely to feel that environmental issues related to habitats and ecosystems are an extremely high priority, and therefore, most likely to undertake action on behalf of Florida's environment:

1. Hunters
2. Residents aged 25-34
3. Salt water anglers
4. Sailors
5. Fresh water anglers

The following groups were the least likely to feel that environmental issues related to habitats and ecosystems are an extremely high priority. Environmental education programs on habitats and ecosystems with these groups should focus on a basic understanding of Florida's habitats and ecosystems.

1. Residents aged 65 and older
2. Tourists
3. Residents aged 55-64 years old

It is important to note that almost all of the target groups that feel issues related to habitats and ecosystems are an extremely high priority are groups that have a direct connection to those ecosystems and habitats -- hunters, fresh and salt water anglers, and sailors. This should be used as a jump off point with these markets. These target groups have a vested interest in healthy habitats and ecosystems. It is also important to note that those least likely to feel habitats and ecosystems are a priority are older Floridians. Programs that develop an empathy and understanding of Florida's unique habitats and ecosystems among Florida's residents 55 years old

and older should be considered a priority among Florida environmental education efforts that have ecosystems and habitats as a topic area. Tourists should also be targeted here and the data collected in this study lends credence to the importance of ecotourism. Teaching tourists about Florida's unique habitats and ecosystems is a positive way to build support for Florida's natural environment among this unique target market.

Coastal Protection

Coastal protection was an important but second-tier priority for Florida environmental educators, scientists, and natural resource administrators. Although not top-of-the-mind as an important environmental concern for Floridians, it is considered an important priority issue for environmental education efforts. Among Florida environmental educators, scientists, and natural resource administrators, there was no clear cut subject matter as a priority for coastal resources, though beach preservation and development were important for some. It is interesting to note that beach erosion was the highest priority environmental problem among Floridians although it was only a minor issue as a coastal protection environmental education subject among educators, scientists, and administrators. It is important to include human health factors as they relate to coastal protection, such as the cleanliness of fish and shellfish, in any program focusing on this topic. As previously noted, the public is more concerned about health issues than they are about other issues such as the recreational value of the coast or the habitat issues. These are certainly important, but not nearly as important as the human health issue. The following groups were the most likely to feel that environmental issues related to coastal protection are an extremely high priority, and therefore, most likely to undertake action on behalf of Florida's environment:

1. Residents with graduate or professional degrees
2. Sailors
3. People who have lived in Florida 5 years or less
4. Residents aged 55-64 years old
5. Residents aged 35-44 years old

The following groups were the least likely to feel that environmental issues related to coastal protection are an extremely high priority:

1. Residents who have lived in Florida 5-9 years
2. Residents with some college/trade school
3. Tourists
4. Residents aged 65 years old or older
5. Urban residents

6. People who have lived in Florida 10-19 years
7. Residents aged 45-54 years old

Endangered Species

Environmental education programs focused on endangered species were not a top priority for Florida environmental educators, scientists, and natural resource administrators. However, endangered species issues were an important topic for many Floridians. Because of the familiarity and support, in general, for endangered species programs, some environmental education efforts should continue to inform and educate Floridians about endangered species. Although Floridians care about and support endangered species programs, the level of factual information was remarkably low. Florida environmental education programs should continue to stress the connection between endangered species and habitat loss. Though empathy for endangered species is important, the overall lack of any kind of factual knowledge among Floridians regarding endangered species should also be noticed by educators. Target audience selection for endangered species programs in Florida should consider the importance of age as it relates to attitudes toward endangered species. Young Floridians, those between the ages of 18 and 34, were the most concerned with endangered species while older Floridians, those over 45 years of age, were the least concerned. It should be noted that although residents with graduate or professional degrees were very sensitive to other top environmental issues in Florida, issues related to endangered species were an exception. We do not have any quantified data on this, however, we suspect that these Floridians understood many of the root problems of species endangerment, including development, habitat loss, and habitat fragmentation.

Environmental Action

Although we do not recommend against environmental education programs that focus on environmental action as a stand alone topic, a more important role of environmental action would include well-designed, action-education programs within each of the five recommended topic areas aimed at the recommended target audiences. For example, programs that teach positive environmental actions related to water resources should be targeted at the top target audiences for this topic: sailors, residents with graduate or professional degrees, fresh water anglers, residents with college degrees, residents aged 35-44, those having lived in Florida 5-9 years, and residents aged 55-64. Recycling was an important breakthrough in developing the

propensity to act on behalf of the environment. Action components of environmental education programs should build on the fact that most Floridians recycle. The high degree of recycling in Florida should be recognized in programs and used as the basis for other positive environmental action programs, the highest priority of which should be actions related to water conservation, although action can be used in other programs as appropriate. The following are the groups in Florida with the highest propensity to act on behalf of Florida's natural environment:

1. Hunters
2. Sailors
3. Floridians with graduate or professional degrees
4. Floridians with a college degree
5. Salt water anglers
6. Motorboaters
7. Fresh water anglers
8. Residents aged 45-54 years old
9. Floridians who have visited a state park or natural area
10. Voters
11. Suburban residents

It is interesting to note some of the groups that are the least likely to act on behalf of the environment:

1. Floridians without a high school diploma
2. Non-voting Floridians
3. People who have lived in Florida less than 5 years
4. Residents with a high school diploma
5. Residents aged 18-24 years old
6. Female residents
7. Urban residents
8. Floridians over 65 years old

Action programs should target one or two (with a maximum of three) groups at a time. There are several other considerations when developing projects and programs to create positive environmental behaviors:

1. Develop programs that appeal to people's emotions. The emotional element is necessary to motivate people on environmental issues. Additionally, although Floridians care about environmental issues, their environmental knowledge levels are quite low. Strive to teach factual knowledge for sure, but programs based upon emotional appeals work well, too.
Do you remember that commercial; the one with the Indian in the canoe in the water?
It used to bring tears to my eyes.
Yes, I remember that.
Yes, that was a good one.
That one made you think.

I haven't seen it in years but it was an eye catcher. That was about the best one. We never forgot it, and never throw trash in the water.

- Excerpt from a focus group conducted by Mark Damian Duda & Associates for the National Oceanic and Atmospheric Administration on water quality issues.

2. Inform target groups of specific things they can do to help the situation. A lack of specificity in the past has led to confusion about what to do. Also, target groups should be given one message at a time. Too many action items make for a confusing campaign.
3. An environmental action program must be made convenient for people to want to participate. Many action programs are inconvenient and not worth the trouble to some groups.
4. People must be constantly reminded about the progress they're making. Without seeing the direct results of their efforts, they lose sight of the goal and lose interest in the program. This implies that messages must be redundant.
5. Programs must be sincere. Distrust of government is high. Research indicates that one reason for not participating in some environmental programs is the perception of personal agendas and a lack of following through on a government's well-intended program.
6. Action programs are usually best when they are local.

Florida environmental educators should be aware of these issues and evaluate whether they apply to their own situation and target audience.

Other Recommendations

- There is some distrust among Floridians for governmental agencies to carry through on environmental promises.

There was a big tax for the Everglades, right? . . . They tried to pass a penny tax on the sugar growers. . . (the sugar tax) they were going to assess a penny a pound to save the Everglades. The agency was down in the southwest part of the state and they would decide how to save the Everglades. The sugar lobbyists got so strong, they went in and educated everyone that out of every dollar, 60 to 70 cents would go toward regulating and towards the paying the agency to tax the sugar growers. Only a small percentage would go towards (saving) the Everglades.

- Florida resident

You can't depend on government for everything. There are enough interested organizations that can be ecology minded, they should be given tax breaks or something to get the message out, whether it be television or whatever. It's got to be private organizations that have no political ties, who are not looking for anyone's votes, not catering to industry; it has to be private citizens organizing. They have to have some political clout, they have to have candidates who support them. The government needs to decide what's good for the country. But I'm not sure who should be doing (environmental education).

- Florida tourist

The children (should be involved), I don't think the government should (do everything), they do enough, they don't need to do anymore. They have to have rules for industry, but for the

(education), I don't think so.

- Florida tourist

There's always two sides to every story. You hear one side, then the other. You need to hear both sides. You need somebody in the middle telling you what's true and what's really going to happen.

- Florida tourist

The ACEE and Florida educators should be aware that although there is strong support for environmental protection and environmental education, there is some skepticism among Floridians on the ability of the government to get the job done, and get the job done by itself. The sugar ballot initiative appears to be an example. First, the sugar tax initiative was not defeated on anti-environmental grounds, but on grounds of government inefficiency. Environmental educators can counter these future arguments by enhancing public communications efforts on the environmental successes of government agencies. Another upshot to this is the importance of partnerships with government, non-government, and private business interests to enhance confidence in environmental efforts.

- The ACEE and the Florida environmental education community should consider refocusing some resources to distributing, promoting, and repeating existing programs and products rather than continually developing new environmental education materials, programs, and products.

We believe it is very important to consider the importance of spending the necessary resources distributing, promoting, and reusing the many excellent education programs that have already been developed. Program and product development is expensive and many times once a product or program is developed and presented once or twice it is retired, only for the cycle to begin again. We recommend that the Florida environmental education community spend the necessary resources promoting and distributing previously successful environmental education programs and products. Only a small number of Floridians have seen or heard any of the many excellent products and programs already developed. Spend resources in developing a few excellent programs, projects, and materials and then spend the necessary time and money distributing and promoting the education programs and materials, as opposed to developing numerous programs and products and not spending the necessary time promoting and distributing them.

- The ACEE and the Florida environmental education community should strongly encourage the dissemination of environmental education information and training materials to Florida environmental educators, scientists, biologists, and administrators through in-service workshops, continuing education courses, seminars, and workshops.

The most important sources of information about environmental education for Florida educators, administrators, and scientists were in-service workshops, continuing education courses, seminars, and conferences. Seventy-three percent said these were very important (a total of 94% said important). More educators considered in-service workshops, continuing education courses, seminars, and conferences very important than administrators (82% vs. 62%). Another important source of information was government organizations. Fifty-three percent of respondents said this was a very important source (a total of 92% said important). Private organizations were considered very important by 42% (a total of 89% said important), peer-reviewed journals were considered very important by 43% (a total of 82% said important), textbooks and reference journals were considered very important by 34% (a total of 80% said important), respondents' own formal education were considered very important by 38% (a total of 79% said important), and teaching organizations were considered very important by 45% (a total of 78% said important). More educators considered teaching organizations very important than administrators (58% vs. 32%). The general media was considered very important by 29% (a total of 74% said important). The least important sources were the Internet and computer networks: 25% considered them very important (a total of 57% said important).

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Appendix A: Methodology

Phase I: Literature Review

We conducted a review of the literature for Florida environmental education needs. This was accomplished by reviewing journals, magazines, newsletters, other publications, and World Wide Web sites for information on Florida, and conducting a content analysis. We simply tallied the general topic of the information and the number of times the topic was covered. This gives insight into perceived needs in Florida. We also reviewed several general publications which covered matter specific to Florida (Moulton and Sanderson, 1997; Lord, 1993; Florida Conservation Foundation, 1987). However, a word of caution is needed. A content analysis of this type is qualitative, even though we are able to report actual numbers. Qualitative analysis will yield information of fairly high validity, but low reliability. In other words, we feel that these topics are important, but any ranking or comparison with other studies is subjective. The following World Wide Web sites were examined:

- Florida Advisory Council o Environmental Education
- Florida Game and Fresh Water Fish Commission
- South Florida Environmental Reader
- Florida Conservation Foundation
- The Everglades Home Page
- Florida Cooperative Wildlife Extension Service
- Guide to Florida Environmental Issues and Information
- Florida Educator's Cyberspace Navigator
- University of Florida Education Library Homepage
- Environmental Professionals National Technical Communications Co., Inc.

The following periodicals and journals were reviewed:

- Resource Management Notes
- Florida Environmental and Urban Issues
- Florida Science Teacher
- Florida Naturalist
- Florida Field Naturalist
- Florida Wildlife Magazine
- ENFO Report
- Florida Environments
- Specifer: Practical Information for Environmental Professionals
- EE Connections

Phase II: Telephone Survey of Florida Environmental Educators', Scientists', and Natural Resource Administrators' Attitudes Toward Environmental Education in Florida

The purpose of this telephone survey was to assess Florida educators', environmental scientists', and natural resource administrators' attitudes toward Florida's key environmental issues. In order to comprehensively assess environmental issues affecting Florida, as well as issues related to environmental education, state natural resource and environmental administrators, scientists, and members of the League of Environmental Educators of Florida (LEEF) were interviewed using a standardized telephone questionnaire of approximately ½-hour in length during May and June of 1997. State administrators and scientists were encouraged to conduct the interview personally, but replacements were interviewed as requested. In the analysis, survey responses between two different groups were compared: educators and administrators. A total of 125 persons were interviewed. Sixty-two described their primary responsibilities as educators, 50 as administrators, and eight as scientists. Four respondents could not place themselves in any of these three categories. Responses from educators and administrators were compared because of larger sample sizes. The low number of scientists in the sample appears to reflect the fact that many scientists' primary responsibilities are administrative and thus classified themselves as administrators.

Phase III: Focus Groups and Open-Ended Interviews

Qualitative research was conducted prior to the quantitative research in Phase IV to assist in the development of a meaningful survey instrument. A focus group was conducted with residents of the Tampa Bay area and fifteen open-ended interviews were conducted with tourists to Florida. These focus groups and interviews were conducted in order to assess awareness, opinions, attitudes, beliefs, and values concerning environmental awareness, environmental issues, and environmental education in Florida. The focus group was conducted with members of the Florida general public. No prior screening was done other than to insure that the participants were able to verbalize their opinions, had some general awareness of the issues, and were Florida residents.

The methodology for the focus group was formal rather than modified. Formal focus groups are as noted by Krueger (1988:59-106) and involve the use of one-way mirrors and non-intrusive

observation. The modified, or "natural," groups are as noted by Frey and Fontana (1993:29-32). In modified groups the use of video tapes and non-intrusive observation is not a factor. Elsewhere we have used both of these techniques on other environmental-related topics (Bissell and Duda, 1993:3-11 and Bissell and Duda, 1995:3-5).

The analysis of the focus group is an iterative process. The moderator makes notes and observations at the time of the focus group. The video tape is viewed and listened to in detail. A second review is done and excerpted transcripts are made. The transcripts are then reviewed and highlighted for the most relevant comments. The transcripts are then sorted into categories and compiled into the draft report and analysis. Transcripts and the final report and analysis are prepared. Thus, six reviews of the data are done in the analysis of the focus group.

The interviews were conducted along the general lines of McCracken (1988) in that they followed a prepared questionnaire. These open-ended interviews were recorded for analysis. This differs from the interview method of Whyte (1984:97-113) by the factor of being one-time-only interviews and that they did not involve extensive knowledge of the subject by the interviewer. The analysis of the interviews was done by listening to the audio tapes, making excerpted transcripts, reviewing the transcripts, sorting the transcripts into categories, and preparing the final report. Thus these interviews were analyzed by an iterative process which involved five stages. This also differs from the analytical protocol of Whyte (1984:225-263) primarily in that the interviewer had no role in the analysis.

Open-ended interviews were conducted with tourists to Florida because of the extreme difficulty in obtaining tourists who would participate in a two-hour focus group. The open-ended interviews were structured using the same discussion outline used in the focus group with Floridians. Thus, this report combines the information gathered from two different sources, by two different methods, and involves two different analytical protocols. This multimethod approach is well accepted in this general area (see; Brewer and Hunter, 1989, and various authors in Van Maanen, 1979) and is referred to as "triangulation." Given all this, it is still wise to make a cautionary note. Both focus groups and open-ended interviews are qualitative research methods. They produce results with extremely high content validity, or the total range of

opinions (Babbie, 1989:125), but are not random survey samples. They should not be used to estimate relative levels of disagreement or agreement with positions or the understanding of factual issues. They are, however, extremely useful in the development of an understanding of attitudes, issues, and concerns. Also, it is wise to remember that focus groups tend to homogenize opinions. Differences tend to be less distinct and, if the focus group dynamic is working, a group opinion will emerge. Thus focus groups tend to expose issues of high salience or agreement within groups, but do not necessarily show the degree of relevance to other issues. Focus groups, as such, will not yield results which can be replicated to any degree of statistical accuracy. Interviews, on the other hand, tend to be single opinions taken in a limited context. They are a "snap-shot" of opinion. There is also the interesting side issue of the interviewees trying to "please" the interviewer and say what they think is the "correct" answer.

Phase IV: Survey of Floridians' and Tourists' Opinions and Attitudes Toward Environmental Issues and Environmental Education

This phase was designed to quantitatively assess Florida residents' and tourists' opinions on, attitudes toward, and knowledge of environmental issues and environmental education in Florida. The questionnaire was developed by Mark Damian Duda & Associates and edited for use with tourists and Spanish-speaking residents. A pre-test of the questionnaire was conducted, and based on the pretest, several revisions and clarifications were made. Fieldwork for the survey began on December 3, 1997 and lasted until January 16, 1998.

Resident Sample

Telephones were selected as the preferred sampling medium since nearly all residents of Florida have access to a telephone. In addition, a central polling site allowed for rigorous quality control over the interviewers and data collection. Samples of telephone numbers, and thereby households, were purchased from Survey Sampling, Inc. (SSI) of Fairfield, Connecticut. The questionnaire was administered in both English and Spanish. RM maintains its own telephone interviewing facilities in-house. These facilities are staffed by interviewers with experience conducting computer-assisted telephone interviews on the subject of natural resources and outdoor recreation for state fish and wildlife agencies. A total of 36 different interviewers collected the data for this project. RM conducted the telephone interviews utilizing

"Questionnaire Programming Language 4.0." RM has designed a telephone interviewing facility that stresses the importance of highly-trained telephone interviewers who work under the close supervision of RM professional staff. The project supervisor edits each completed survey to check for clarity, understanding, completeness, and form. To ensure the data collected is of the highest quality, the interviewers are trained according to the standards established by the Council of American Survey Research Organization. Method of instruction includes lecture and role-playing. The project supervisor conducts project briefings with the interviewing crew prior to working on the specific project. Interviewers are instructed on the following: study goals and objectives, type of study, handling of survey questions, interview length, termination points and qualifiers for participation, reading of interviewer instructions, reading of survey, reviewing skip patterns, and probing and clarifying techniques necessary for specific questions on the survey instrument. Findings are reported at a 95% confidence interval with a sampling error of $\pm 3.5\%$ ($n=773$). This means that if the resident survey was administered 100 times to different samples that were selected in the same fashion, 95 of the surveys' findings would fall within $\pm 3.5\%$ of each other. Some response distributions may not add to 100% exactly due to rounding, while a few questions allowed for multiple responses. Interviews were conducted Monday through Friday from 9:00 a.m. to 9:00 p.m. and on Saturday from 10:00 a.m. to 4:00 p.m., local times. A five-callback design was used to maintain the representativeness of the sample, avoid bias toward people easy-to-reach by telephone, and provide an equal opportunity for all to participate (in some instances, numbers were called up to eight times). Subsequent calls are placed at different times of the day and different days of the week. This intensive call-back procedure is a good technique for boosting response rates. The software used for data collection was QPL version 4.0 (National Technical Information Services 1996). QPL is a comprehensive system for computer-assisted telephone interviewing. Survey data is entered into the computer as the interview is being conducted, eliminating manual data entry after the completion of the interviews. The survey instrument is programmed so that QPL branches, codes, and substitutes phrases in the survey based upon previous responses to ensure the integrity and consistency of data collection.

Tourist Sample

A market research firm specializing in tourist interviews was contracted by Responsive Management to administer the questionnaire to Florida tourists. Tourists were defined as adult, English-speaking residents of a U.S. state other than Florida. Respondents were randomly chosen from visitors to Universal Studios Florida in Orlando. This firm has sole interview access to Universal Studios. Respondents were offered an incentive of \$2 to participate.